

An example *Geophysics* article, with a two-line title

Joe Dellinger* and Sergey Fomel†

ABSTRACT

This is an example of using `geophysics.cls` for writing *Geophysics* papers.

INTRODUCTION

This is an introduction. \LaTeX is a powerful document typesetting system (Lamport, 1994). An excellent reference is (Kopka and Daly, 2004). The new `geophysics.cls` class complies with the \LaTeX 2e standard. .

THEORY

This is another section.

Equations

Section headings should be capitalized. Subsection headings should only have the first letter of the first word capitalized.

Here are examples of equations involving vectors and tensors:

$$\mathbf{R} = \begin{pmatrix} R_{XX} & R_{YX} \\ R_{XY} & R_{YY} \end{pmatrix} = \mathbf{P}_{M \rightarrow R} \mathbf{D} \mathbf{P}_{S \rightarrow M} \mathbf{S} \quad , \quad (1)$$

and

$$R_{j,m}(\omega) = \sum_{n=1}^N P_j^{(n)}(\mathbf{x}_R) D^{(n)}(\omega) P_m^{(n)}(\mathbf{x}_S) \quad . \quad (2)$$

Note that the macro for the `\tensor` command has been changed to force tensors to be bold uppercase, in compliance with current SEG submission standards. This is so

*BP UTG, 200 Westlake Park Blvd, Houston, TX, 77079,
†Bureau of Economic Geology, John A. and Katherine G. Jackson School of Geosciences, The University of Texas at Austin, University Station, Box X, Austin, TX 78713-8924

that documents typeset to the old standards will print out according to the new ones: e.g., tensor \mathbf{T} (note converted to uppercase).

Figures

Figure 1 shows what it is about.

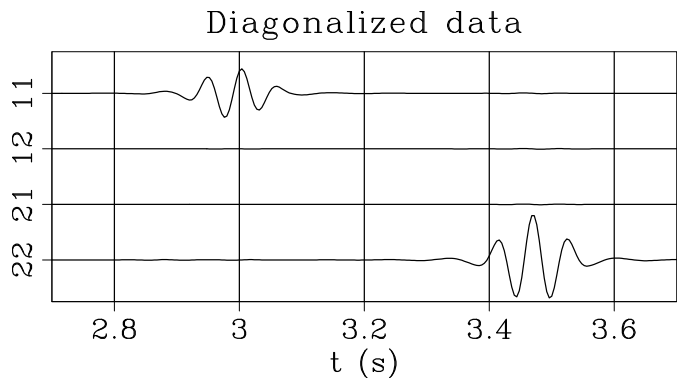


Figure 1: This figure is specified in the document by `\plot{waves}{width=\columnwidth}{This caption.}`.

Multiplot

Sometimes it is convenient to put two or more figures from different files in an array (see Figure 2). Individual plots are Figures 2a and 2b.

The first argument of the `multiplot` command specifies the number of plots per row.

Tables

The discussion is summarized in Table 1.

ACKNOWLEDGMENTS

I wish to thank Ivan Pšenčík and Frédéric Billette for having names with non-English letters in them. I wish to

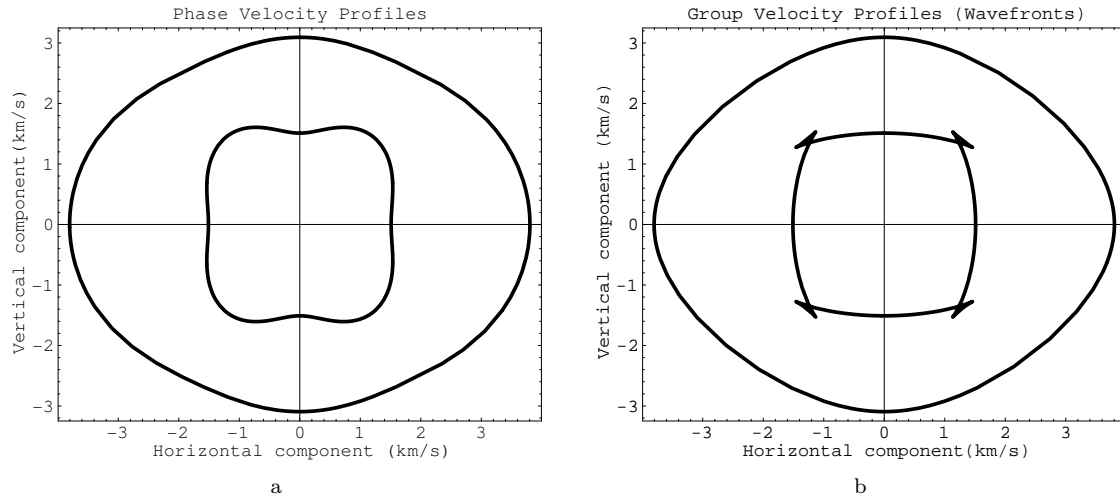


Figure 2: This figure is specified in the document by `\multiplot*{2}{exph,exgr}{width=0.8\columnwidth}{This caption.}`.

| Table Example | | |
|-------------------------|---------------------------------|---|
| migration | $\omega \rightarrow k_z$ | $k_y^2 + k_z^2 - z^2 \cos^2 \psi = 4\omega^2/v^2$ |
| zero-offset diffraction | $k_z \rightarrow \omega_0$ | $k_y^2 + k_z^2 = 4\omega_0^2/v^2$ |
| DMO+NMO | $\omega \rightarrow \omega_0$ | $\frac{1}{4}v^2k_y^2 \sin^2 \psi + \omega_0^2 \cos^2 \psi = \omega^2$ |
| radial DMO | $\omega \rightarrow \omega_s$ | $\frac{1}{4}v^2k_y^2 \sin^2 \psi + \omega_s^2 = \omega^2$ |
| radial NMO | $\omega_s \rightarrow \omega_0$ | $\omega_0 \cos \psi = \omega_s$ |

Table 1: This table is specified in the document by `\tabl*{example}{This caption.}{...}`.

thank Červený (2000) for providing an example of how to make a bib file that includes an author whose name begins with a non-English character and Forgues (1996) for providing both an example of referencing a Ph.D. thesis and yet more non-English characters.

APPENDIX A

APPENDIX EXAMPLE

According to the new SEG standard, appendices come before references.

$$\frac{\partial U}{\partial z} = \left\{ \sqrt{\frac{1}{v^2} - \left[\frac{\partial t}{\partial g}\right]^2} + \sqrt{\frac{1}{v^2} - \left[\frac{\partial t}{\partial s}\right]^2} \right\} \frac{\partial U}{\partial t} \quad (\text{A-1})$$

It is important to get equation A-1 right. See also Appendix B.

APPENDIX B

ANOTHER APPENDIX

$$\frac{\partial U}{\partial z} = \left\{ \sqrt{\frac{1}{v^2} - \left[\frac{\partial t}{\partial g}\right]^2} + \sqrt{\frac{1}{v^2} - \left[\frac{\partial t}{\partial s}\right]^2} \right\} \frac{\partial U}{\partial t} \quad (\text{B-1})$$

Too lazy to type a different equation but note the numeration.

The error comparison is provided in Figure B-1.

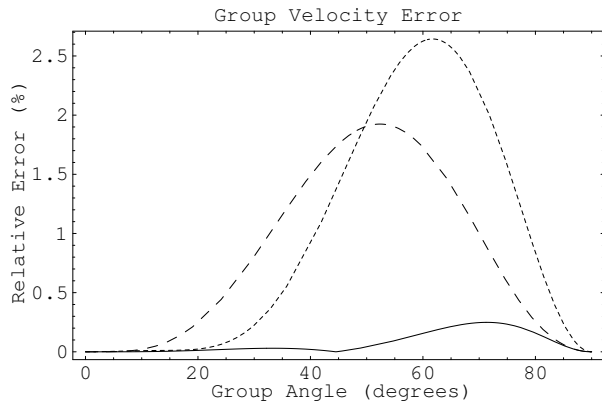


Figure B-1: This figure is specified in the document by `\plot{errgrp}{width=0.9\columnwidth}{This caption.}`.

APPENDIX C

THE SOURCE OF THIS DOCUMENT

```

\documentclass[paper,twocolumn,twoside]{geophysics}

% An example of defining macros
\newcommand{\rs}[1]{\mathstrut\mbox{\scriptsize\rm #1}}
\newcommand{\rr}[1]{\mbox{\rm #1}}

\begin{document}

\title{An example \emph{Geophysics} article, \\ with a two-line title}

\renewcommand{\thefootnote}{\fnsymbol{footnote}}

\address{
\footnotemark[1]BP UTG,
200 Westlake Park Blvd,
Houston, TX, 77079,
\footnotemark[2]Bureau of Economic Geology,
John A. and Katherine G. Jackson School of Geosciences,
The University of Texas at Austin,
University Station, Box X,
Austin, TX 78713-8924}
\author{Joe Dellinger\footnotemark[1] and Sergey Fomel\footnotemark[2]}

\footer{Example}
\lefthead{Dellinger \& Fomel}
\righthead{\emph{Geophysics} example}

%\maketitle is unnecessary

\begin{abstract}
  This is an example of using \textsf{geophysics.cls} for writing
  \emph{Geophysics} papers.
\end{abstract}

\section{Introduction}

This is an introduction. \LaTeX\ is a \new{powerful} document
typesetting system \cite[]{\lamport}. An excellent reference is
\cite[]{kopka}. The new \textsf{geophysics.cls} class complies with
the \LaTeX2e\ standard. \old{We had something else written here but
decided to get rid of it}.

\section*{Theory}

This is another section.

\subsection{Equations}

Section headings should be capitalized. Subsection headings should only
have the first letter of the first word capitalized.

Here are examples of equations involving vectors and tensors:
\begin{equation}
\text{\tensor{R}} = \text{\pmatrix{R_{\rs{XX}} & R_{\rs{YX}} \cr R_{\rs{XY}} & R_{\rs{YY}}}}
=

```



```


$$\omega \rightarrow k_z \text{ \& } k_y^2 + k_z^2 \cos^2 \psi = 4\omega^2/v^2$$



---



$$k_z \rightarrow \omega_0 \text{ \& } k_y^2 + k_z^2 = 4\omega_0^2/v^2$$



---


DMO+NMO 
$$\omega \rightarrow \omega_0 \text{ \& } \frac{1}{v^2 k_y^2 \sin^2 \psi + \omega_0^2 \cos^2 \psi} = \omega^2$$



---


radial DMO 
$$\omega \rightarrow \omega_s \text{ \& } \frac{1}{v^2 k_y^2 \sin^2 \psi + \omega_s^2} = \omega^2$$



---


radial NMO 
$$\omega_s \rightarrow \omega_0 \text{ \& } \omega_0 \cos \psi = \omega_s$$



---



```

ACKNOWLEDGMENTS

I wish to thank Ivan P_{en} and Fr_{ed}eric Billette for having names with non-English letters in them. I wish to thank [Cervený](#) for providing an example of how to make a bib file that includes an author whose name begins with a non-English character and [forges96](#) for providing both an example of referencing a Ph.D. thesis and yet more non-English characters.

Appendix example

According to the new SEG standard, appendices come before references.

```

\begin{equation}
\frac{\partial U}{\partial z} =
\left\{
\sqrt{\frac{1}{v^2} - \left[\frac{\partial t}{\partial g}\right]^2} +
\sqrt{\frac{1}{v^2} - \left[\frac{\partial t}{\partial s}\right]^2}
\right\}
\frac{\partial U}{\partial t}
\label{eqn:partial}
\end{equation}

```

It is important to get equation[~][\ref{eqn:partial}](#) right. See also Appendix[~][\ref{equations}](#).

Appendix[equations]{Another appendix}

```

\begin{equation}
\frac{\partial U}{\partial z} =
\left\{
\sqrt{\frac{1}{v^2} - \left[\frac{\partial t}{\partial g}\right]^2} +
\sqrt{\frac{1}{v^2} - \left[\frac{\partial t}{\partial s}\right]^2}
\right\}
\frac{\partial U}{\partial t}
\label{eqn:partial2}
\end{equation}

```

Too lazy to type a different equation but note the numeration.

The error comparison is provided in Figure~\ref{fig:errgrp}.

```
\plot{errgrp}{width=0.9\columnwidth}
{This figure is specified in the document by \texttt{
  $\backslash$plot\{errgrp\}\{width=0.9$\backslash$column\-width\}\{This caption.\}}.
}

\onecolumn

\append{The source of this document}
\verbatiminput{geophysics_twocolumn.tex}

\append{The source of the bibliography}
\verbatiminput{example.bib}

\twocolumn

\bibliographystyle{seg} % style file is seg.bst
\bibliography{example}

\end{document}
```

APPENDIX D

THE SOURCE OF THE BIBLIOGRAPHY

```
@Book{lampport,
  author = {L[eslie] Lampport},
  title =  {\LaTeX: A} Document Preparation System},
  publisher = {Addison-Wesley},
  year = 1994
}

@Book{kopka,
  author = {H[elmut] Kopka and P[atrack] W[] Daly},
  title = {Guide to {\LaTeX}},
  publisher = {Addison-Wesley},
  year = 2004
}

\preamble{"\newcommand{\SortNoop}[1]{}"}
@Book{Cervený,
  author = {V[] {\SortNoop{Cervený}}\v{C}erven\`{y}},
  title = {Seismic Ray Method},
  year = {2000},
  publisher = {Cambridge University Press}
}

@PHDTHESIS{forgues96,
  author = {E. Forgues},
  title = {Inversion linearis\`{e}e multi-param\`{e}tres via la th\`{e}orie des rais},
  school = {Institut Fran\c{c}ais du P\`{e}trole - University Paris VII},
  year = {1996}
}
```

REFERENCES

- Červený, V., 2000, Seismic ray method: Cambridge University Press.
- Forgues, E., 1996, Inversion linearisée multi-paramètres via la théorie des rais: PhD thesis, Institut Français du Pétrole - University Paris VII.
- Kopka, H., and P. W. Daly, 2004, Guide to L^AT_EX: Addison-Wesley.
- Lamport, L., 1994, L^AT_EX: A document preparation system: Addison-Wesley.